

**-- REVISED --**

**PROPOSED  
2003 STATE AND FEDERAL STRATEGY FOR  
THE CALIFORNIA STATE IMPLEMENTATION PLAN**

**SECTION IV  
LONG-TERM STRATEGY**

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## **CHAPTER A. INTRODUCTION**

The federal Clean Air Act (CAA) recognizes that extreme ozone nonattainment areas, such as the South Coast, must rely on evolving technologies to meet attainment goals. As such, CAA Section 182(e)(5) specifically authorizes the inclusion of long-term measures that anticipate the development of new control techniques or improvement of existing control technologies. When the San Joaquin Valley acts on its intended request for reclassification as an extreme ozone area, it will also be eligible for these long-term technology provisions.

This Section describes the concepts that the State will explore to reduce emissions beyond the levels achievable with the proposed State defined measures, and presents approaches the federal government could use to reduce the contribution from sources under its control. It also includes a commitment to identify additional strategies in a public process.

As part of the public process to develop new emission reduction strategies, ARB staff also identified approaches that, although promising, face barriers to successful implementation. Examples include strategies that could not be successful without significant technological advances, improvements to reduce cost or increase cost-effectiveness, or the securing of a dependable stream of financial incentives.

ARB has a long-standing history of successfully adopting and implementing both technology-advancing strategies and innovative emission control techniques. By working closely with the regulated industry and research scientists, ARB staff have been able to craft regulations that are stringent enough to compel technology development, yet flexible enough to encourage industry innovations. Since 1998, the State has also provided over \$200 million in funding for innovative incentive programs to speed the conversion to cleaner trucks, off-road equipment, agricultural irrigation pumps, and harborcraft; another \$50 million (from Proposition 40 funds) is earmarked for the next two years. Although this funding is not permanent, it is helping to reduce nitrogen oxide (NO<sub>x</sub>) and inhalable particulate matter (PM<sub>10</sub>) emissions, as well as demonstrate the feasibility of retrofit technologies.

### **1. Need for Long-Term Strategy**

The defined State measures will provide sizeable benefits, but not enough to meet existing SIP attainment needs in the South Coast and San Joaquin Valley. Both of these areas, and perhaps others, will need significant additional emission reductions beyond those we will realize with defined State measures. To meet our current obligations under federal law, we must secure extensive further emission reductions from long-term measures by 2010.

Other regions in California would also benefit from statewide long-term strategies. In 1997, U.S. EPA promulgated tighter new federal air quality standards for

eight-hour ozone and PM<sub>2.5</sub>. Almost half of the counties in California are anticipated to be nonattainment for the eight-hour ozone standard. Based on preliminary air quality monitoring data, the South Coast, San Joaquin Valley and some other urban areas are also likely to be nonattainment for the federal PM<sub>2.5</sub> standards. In addition, virtually all areas of California do not meet ARB's health-based ambient air quality standards. Because a large proportion of the emissions contributing to California's ozone and fine particulate problems are from sources under State and federal authority, additional measures to reduce the impact of cars, trucks and equipment will be critical to meeting the new federal standards in the post-2010 timeframe. Achieving the more protective standards will require substantial emission reductions beyond those needed to meet the one-hour federal ozone standard.

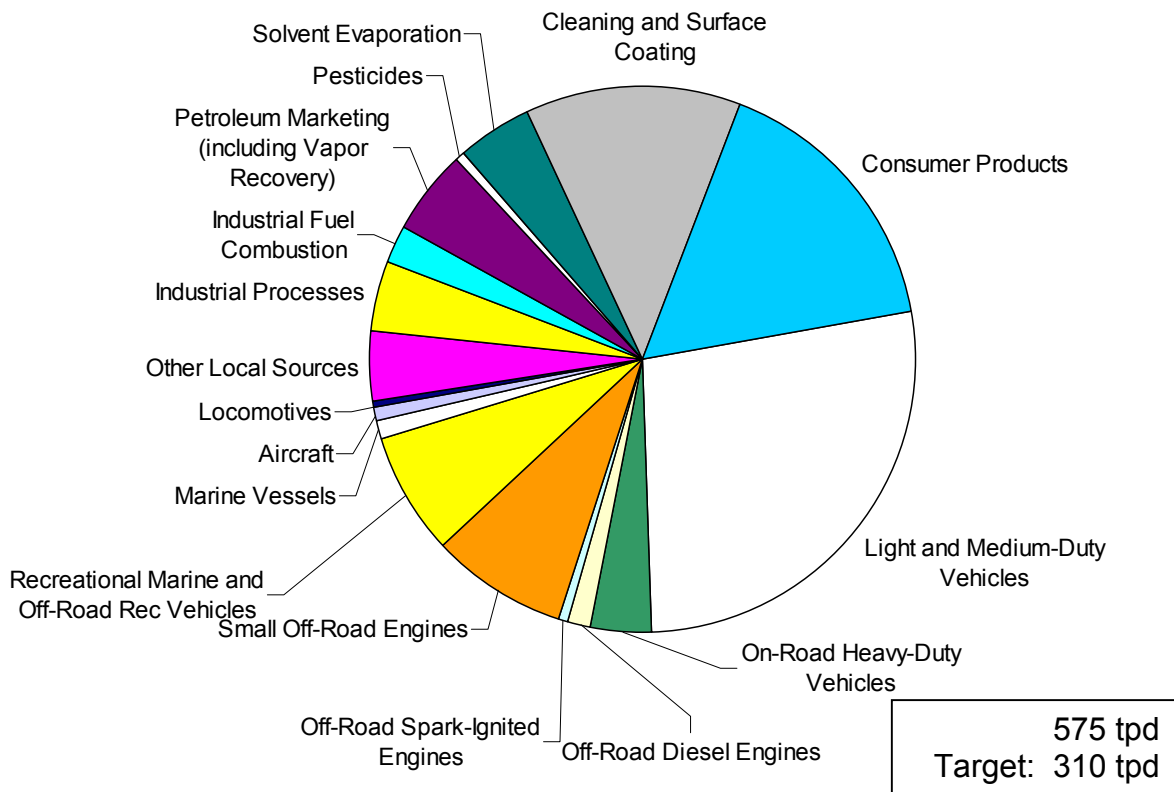
## **2. Sources Of Remaining Emissions In 2010**

As a starting point for discussion of the long-term strategy, Figures IV-1 and IV-2 below illustrate where the remaining reactive organic gas (ROG) and NO<sub>x</sub> emissions will be in the South Coast in 2010 if all of the defined State and local measures are implemented. The figures assume that each defined control measure in this document obtains the mid-range of estimated emission reductions.

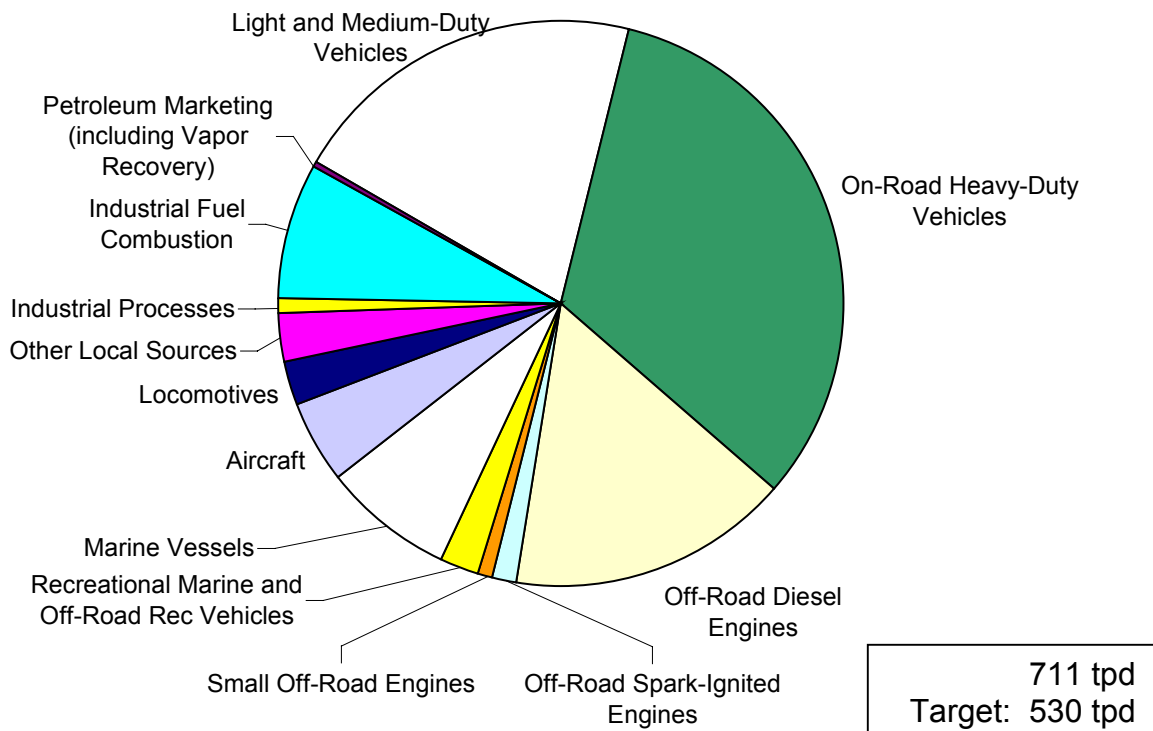
In the South Coast, and we anticipate the San Joaquin Valley as well, agencies at all levels must deliver new reductions to help meet the federal one-hour ozone standard by 2010. Mobile sources under the legal or practical control of the federal government are an important contributor to California's air quality problems. The federal CAA directs U.S. EPA to continue reducing mobile source emissions that cause or contribute to air pollution that endangers public health. The magnitude of the additional reductions required to attain air quality standards necessitates that federal government agencies with authority to control air pollution share responsibility for reaching attainment targets.

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**Figure IV-1: ROG Emissions Remaining After Near-Term Measures  
South Coast 2010**



**Figure IV-2: NOx Emissions Remaining After Near-Term Measures  
South Coast 2010**



## **CHAPTER B. CONCEPTS FOR LONG-TERM MEASURES**

### **1. Possible State Approaches**

Table IV-1 lists possible approaches as a starting point for development of the long-term measures. ARB staff appreciates the fact that the possible measures discussed in this Section may be highly speculative in today's terms. Success may depend on making significant technological advances, surmounting major implementation barriers (including cost-effectiveness), and obtaining financial incentives. And while some technologies may not be feasible until 2010 or later, a continued focus on the state-of-the-art for different source categories can bring attention and support to the need for increasingly lower-emitting activities. One of our goals is to lay the groundwork now that will result in the development, commercialization, and use of zero and near-zero emission technologies by 2010 and beyond.

ARB intends to provide opportunities for the public to offer additional input on this list – and as we develop the measures. The process will include an investigation of the technical feasibility and timeframe for emission reduction techniques that may not be currently available. The assessment will cover efforts to develop and commercialize advanced and emerging technologies for new and in-use engines, as well as to reformulate consumer products. The assessment will also determine the extent to which emission reduction strategies such as market incentive programs, pollution prevention, public education, and voluntary efforts can complement and enhance the effectiveness of traditional control approaches.

In addition to meeting the federal one-hour ozone standard, ARB staff believes that the process we are proposing for this long-term strategy will also aid California's efforts to meet more health protective ozone and particulate matter standards, as well as reduce regional haze and the State's contribution to global climate change.

**Table IV-1**  
**Possible State Approaches for Long-Term Measures**

<b>In-Use Light/Medium-Duty Vehicles</b>	<ul style="list-style-type: none"><li>▪ Provide incentives for voluntary passenger vehicle retirement</li></ul>
<b>Smog Check</b>	Explore program expansion to increase benefits, including: <ul style="list-style-type: none"><li>▪ Expanded enhanced smog check</li><li>▪ Opt-in to test-only program</li><li>▪ Replace rolling 30-year exemption with exemption of pre-1975 vehicles</li></ul>
<b>On-Road Heavy Duty Vehicles</b>	<ul style="list-style-type: none"><li>▪ Provide incentives for cleaner trucks and buses, including school buses</li></ul>
<b>Off-Road Engines</b>	<ul style="list-style-type: none"><li>▪ Provide incentives for cleaner off-road vehicles and equipment</li></ul>
<b>Airports</b>	<ul style="list-style-type: none"><li>▪ Pursue approaches to reduce emissions from vehicles traveling to and from airports</li></ul>
<b>Locomotives</b>	<ul style="list-style-type: none"><li>▪ Pursue approaches to reduce emissions from in-use locomotives</li></ul>
<b>Diesel Engines</b>	<ul style="list-style-type: none"><li>▪ Set toxics standard for existing stationary diesel-fueled engines</li><li>▪ Set toxics standard for existing portable diesel engines</li><li>▪ Set toxics standard for diesel-fueled refrigeration units</li></ul>
<b>Fuels</b>	<ul style="list-style-type: none"><li>▪ Set sulfur/ash content limits for diesel engine lubricating oils</li><li>▪ Support infrastructure for zero emission vehicles – electric, fuel cell, hydrogen</li></ul>
<b>Consumer Products</b>	<ul style="list-style-type: none"><li>▪ Consider future consumer products regulations</li></ul>
<b>Public Education Programs and Outreach</b>	<ul style="list-style-type: none"><li>▪ Establish clean air labeling program</li><li>▪ Continue Statewide energy conservation program</li><li>▪ Consider Statewide public education campaign for air quality</li></ul>
<b>Pesticides</b>	<ul style="list-style-type: none"><li>▪ Explore approaches to further reduce volatile emissions from pesticides based on regional need</li></ul>

We briefly describe each of these possible approaches in the following sections.



### ***Light- and Medium-Duty Vehicles***

#### **a. Incentives for Voluntary Accelerated Vehicle Retirement**

This proposal would expand the current Bureau of Automotive Repair (BAR) vehicle retirement program for older vehicles that have failed Smog Check. The idea would be to include vehicles that have passed their most recent Smog Check inspection. By accepting only “passed” vehicles, this concept would avoid double-counting emission reduction benefits from the BAR retirement and repair programs. Emissions would be permanently retired from the air.

### ***Smog Check Program***

The benefits of the Smog Check program could be increased by expanding the most effective elements of the program.

#### **b. Expanded Enhanced Smog Check**

Currently, California has two types of Smog Check inspection tests, two-speed idle and loaded-mode. The two-speed idle test measures hydrocarbon (HC) and carbon monoxide (CO) emissions under idle conditions. The loaded-mode test uses a treadmill-like device to measure NO<sub>x</sub> in addition to HC and CO. The loaded-mode test better simulates real world driving conditions and is more adept at identifying failures in new vehicles. With the implementation of loaded-mode testing and test-only stations under the Enhanced Program in the Bay Area, more vehicles are subject to the most stringent requirements. If loaded-mode testing were fully implemented, additional emission reductions could be achieved.

#### **c. Allow Air Districts to Opt-In to Test-Only Program**

Currently, for attainment areas, unclassified areas, moderate nonattainment areas, and non-urbanized serious, severe, and extreme nonattainment areas, State law allows air districts to request BAR to implement the Enhanced Smog Check program, excluding the test-only requirement. Recently, several air districts chose to implement the Enhanced Smog Check program in their areas. However, current law prohibits air districts from opting into the test-only portion of the Enhanced Smog Check program. If legislation authorizing air districts to also opt in to the test-only portion of the Enhanced Smog Check program were passed, this Smog Check improvement option could provide the air districts more in benefits than the Enhanced Smog Check program without the test-only element.

#### **d. Replace Rolling 30-Year Exemption With Exemption of Pre-1975 Vehicles**

Originally, the Smog Check inspection program applied to all 1966 and newer gasoline vehicles. In 1997, the State Legislature modified the Smog Check program to

exempt pre-1975 vehicles, and beginning in January 2003, to exempt motor vehicles 30 or more model-years old. Because older vehicles contribute a disproportionate amount of emissions (despite their relatively low numbers and use), excluding these older vehicles from the program reduced the effectiveness of the Smog Check program. Replacing the 30-year rolling exemption with the exemption of pre-1975 vehicles would achieve additional emission reductions in future years. In addition, these vehicles would also be eligible for other BAR assistance programs such as vehicle retirement and repair assistance.

### ***On-Road Heavy-Duty Vehicles***

#### **e. Incentives for Cleaner Trucks and Buses, Including School Buses**

For both on-road and off-road diesel engines, ongoing funding for incentive programs such as the Carl Moyer Program and the Lower-Emission School Bus Program would introduce cleaner technology and reduce in-use emissions.

Additional reductions could be achieved with the installation of NOx retrofit technologies such as selective catalytic reductions systems or NOx adsorbers – once these or other NOx retrofit technologies are verified through the ARB's Diesel Emission Control Strategy Verification Procedure. Other long-term advanced technologies could include the use of alternative diesel fuels, and the introduction of extremely low-emitting alternative fuel engines and fuel cells for heavy-duty vehicles.

### ***Off-Road Engines***

#### **f. Incentives for Cleaner Off-Road Vehicles and Equipment**

The fleet of off-road combustion ignition engines is dominated by diesel engines that are usually rebuilt two or three times over their long service lifetime. Providing incentives to re-power older engines with cleaner, lower-emitting engines is one method of providing near-term emission reductions from existing engines. Incentive programs encourage equipment operators/owners to purchase equipment that meets emission levels beyond any State, federal, or local requirements. Incentive programs also encourage reduced emission technology and encourage introduction of new technology into niche markets. Continual funding is critical for incentive programs to succeed.

The concept behind this idea would be to replace, or otherwise upgrade, engines in the existing fleet with lower-emitting engines. Specifically, the order of precedence for the upgrade would be to bring as many pre-Tier 2 engines as possible into compliance with the federal Tier 2 HC+NOx emission standards. For engines where such an upgrade is demonstrated to be infeasible, compliance with Tier 1 emission standards would instead be funded. It is estimated that approximately 85 percent of existing Tier 1 engines and 50 percent of uncontrolled engines could be upgraded to comply with the Tier 2 HC+NOx standards. It is also estimated that 80 percent of the remaining uncontrolled engines could be made to meet the Tier 1 HC+NOx standards.

Replacement engines and/or upgrade kits would have to show compliance with durability requirements. Options for reducing fleet emissions could include the use of alternative fuel engines.

Incentive approaches to speed turnover to cleaner engines could be applied to gas and diesel-powered engines used in other types of off-road vehicles and equipment as well.

### ***Airports***

#### **g. Pursue Approaches to Reduce Emissions from Vehicles Traveling To and From Airports**

Ground access vehicles move airport passengers, employees, and goods to, from, and around the airport. These vehicles include private passenger vehicles, airport shuttles, taxis, hotel shuttles, parking shuttles, cargo vehicles, and tenant and employee vehicles.

Strategies to reduce emissions from ground access vehicles could take several different forms because of the variety and ownership of the vehicles involved. Specific ideas include reducing emissions from airport fleet vehicles using alternative fuels or particulate diesel filters; providing an infrastructure for alternative fuel/electric vehicles between airports and shuttle terminals; consolidating on-airport vehicle travel; emissions-based airport entry fees for cabs and other shuttle vehicles; and increased ground transportation options for both passenger-bound and employee commuting to and from the airport.

### ***Locomotives***

#### **h. In-Use Strategies for Locomotives**

Because of the long life of locomotives, strategies to reduce emissions from the in-use fleet are particularly important. There are a number of potentially viable control techniques for locomotives including accelerating fleet turnover, reduced idling, retrofits, and fuel changes. These types of strategies can be implemented through incentive programs, regulations, voluntary actions, research projects, use of advanced technology, fuel changes, and other methods.

### ***Stationary and Portable Diesel Engines***

New controls to implement ARB's Diesel Risk Reduction Plan may provide additional ROG and/or NO<sub>x</sub> benefits if the retrofit technology reduces multiple pollutants or a compliance strategy includes accelerated replacement with cleaner engines. Because these measures are still being developed for stationary and portable engines under the airborne toxic control measure provisions in State law, we did not include the potential ancillary ROG or NO<sub>x</sub> reductions in ARB's near-term ozone reduction strategy.

Several measures are scheduled for Board consideration in late 2003. Once the measures to reduce diesel PM from these sources have been adopted and the emission reductions are enforceable, ARB would claim any associated reductions in other pollutants against its SIP commitments.

**i. Set Toxics Standard for Existing Stationary Diesel-Fueled Engines**

ARB staff will propose an airborne toxic control measure (ATCM) to address stationary diesel-fueled engines to the Board in October 2003. The ATCM is expected to achieve modest ROG reductions. We will take SIP credit for these reductions, as appropriate.

**j. Set Toxics Standard for Existing Portable Diesel Engines**

ARB staff would assess retrofit technologies for portable diesel engines whose application does not allow for electrification. This could include requiring these engines to be retrofitted to meet emission standards equivalent to Tier IV standards for off-road diesel engines.

**k. Set Toxics Standard for Diesel-Fueled Refrigeration Units**

Transport refrigeration units (TRU) are refrigeration systems powered by diesel engines designed to refrigerate temperature-sensitive products that are transported by semi-trailer vans, truck vans, shipping containers, and rail cars. In addition, shipping containers with temperature-sensitive cargo use electrically-driven refrigeration systems. These systems are plugged into ship power when at sea, but when these containers are transported on land, a diesel-powered generator (TRU gen set) is typically attached to the container to power the refrigeration system.

ARB staff is developing regulations to address emissions from existing TRUs and TRU gen sets. In addition, U.S. EPA has proposed new engine emission standards (which ARB will adopt) that will provide cleaner engines for new TRUs and TRU gen sets.

***Fuels***

**I. Set Sulfur/Ash Content Limits for Diesel Engine Lubricating Oils**

This idea would look at the effect on diesel after-treatment technology from limits on sulfur concentration and/or ash content in diesel engine lubricating oil.

In addition to diesel fuel, engine lubricating oil is a source of sulfur and other constituents potentially harmful to after-treatment control technologies essential to achieving emission reductions. Diesel engines are designed to consume some amounts of engine lubricating oils that are burned along with the fuel. Depending on the

amount of oil consumed and the level of sulfur and other constituents, the oil consumed can adversely affect the after-treatment controls. Also, lubricating oils can contribute to increased engine-out emissions of sulfur. The significance of engine lubricating oils' contribution to engine-out emissions is not known, but current research efforts are investigating this concern.

If the current research efforts indicate that regulatory action is appropriate, then the concentration of sulfur and/or ash content of diesel engine lubricating oils could be limited for both on-road and off-road vehicles. This would minimize emissions increases by curtailing deterioration rates of the control technology.

### ***Consumer Products***

#### **m. Future Consumer Products Regulations**

This idea would focus on additional zero and near-zero technologies that could replace volatile compounds. Additional ideas could include the substitution of reactivity-based strategies for products to reduce ozone-forming emissions.

#### **n. Explore Approaches to Further Reduce Volatile Emissions from Pesticides Based on Regional Need**

This concept would seek to achieve additional ROG reductions from pesticides, beyond those identified in the existing SIP commitment, for areas with a demonstrated regional need for such benefits. In the development of the San Joaquin Valley Ozone SIP, the Department of Pesticide Regulation (DPR) is taking the lead in working with interested stakeholders to determine how pesticide emissions can be further reduced by the attainment deadline.

### ***Public Education Programs and Outreach***

#### **o. Establish Clean Air Labeling Program**

This idea focuses on encouraging consumer purchases of clean products is through a "clean air labeling" program. Such a program would focus and publicize products that emit substantially below any applicable emission standards, or products that have zero or near-zero emissions.

#### **p. Continue Statewide Energy Conservation Program**

The focus of this concept would be to pursue ideas that would result in continued and expanded public and private energy conservation and efficiency programs. In 2001, the State conducted an electricity conservation campaign to avoid rolling blackouts. The campaign achieved a 6.7 percent reduction in electricity consumption and a 10 percent decrease in the number of peak hours, compared to the summer of 2000. Several State agencies made special efforts to promote energy conservation. In

the summer of 2001, the Public Utilities Commission programs cost \$209 million and conserved 238 megawatts (MW). The California Energy Commission spent \$362 million on its peak load reduction programs and saved 454 MW.

**q. Consider Statewide Public Education Campaign for Air Quality**

This concept would involve the establishment of a statewide public education campaign to reduce air pollution. The concept could include ideas to engage the public through (1) public education that more clearly connects voluntary clean air actions with public health benefits, and (2) increasing awareness of available low-emitting consumer products, paints, vehicles, lawn equipment, and recreational vehicles licensed to use clean air “green” labels.

**2. Possible Federal Approaches**

Like State and local agencies, the federal government has a responsibility to further control emissions in response to the contribution from sources under its jurisdiction.

U.S. EPA and ARB are continuing to coordinate on future rulemaking, including three on-going efforts described below. First, U.S. EPA is developing more stringent emission standards for new off-road diesel equipment based on the transfer of emission control technology for on-road engines. These benefits will be critical in the post-2010 timeframe to both offset growth and make progress toward the new, more stringent federal standards. Second, U.S. EPA has proposed to phase in the use of lower sulfur diesel fuel in off-road applications nationwide. Diesel fuel with a 15 parts per million (ppm) sulfur level would support the use of more sophisticated control technology for all types of off-road diesel engines. Third, U.S. EPA is working in parallel with California to develop on-board diagnostics and to strengthen manufacturers’ in-use testing to ensure that new heavy trucks and buses maintain expected emission levels throughout their useful lives.

We expect that U.S. EPA and other federal agencies will secure further reductions, and that the federal government may consider a mix of regulatory programs, incentives or other agreements to achieve reductions.

As part of the evaluation of long-term strategies under our authority, we also identified possible federal emission reduction approaches. Accordingly, ARB staff is including concepts in this document that the federal government could consider. Long-term strategies for new engines in locomotives, ocean-going ships, harbor craft, and commercial and non-tactical military aircraft are a feasible and effective means to cut emissions and will be critical to make progress toward all of the national air quality standards. Because of the extended life of these engines, we believe the long-term strategy will need to rely heavily on programs to replace existing engines with cleaner models or to add emission control equipment. Given the volume of equipment in

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operation and the public health impact of the emissions, it is important that U.S. EPA and its federal partners take early action in this regard.

Table IV-2 lists some possible concepts that we urge the federal government to pursue. This list reflects ARB staff's assessment of current technology. As technology advances, this list could be expanded. In addition, the federal government could provide economic incentives to accelerate clean up of diesel engines, especially those used in school buses and farm operations.

**Table IV-2**  
**Concepts for Federal Action**

On-Board Diagnostics for New Truck/Bus Fleet and In-Use Testing for Existing Truck/Bus Fleet
Lower Emission Standards for New Off-Road Compression Ignition Engines
Low-Sulfur Standards for Diesel Fuel for Off-Road Equipment, Locomotives, and Marine Vessels
More Stringent Emission Standards for New Harbor Craft and Ocean-Going Ships
Clean Up the Existing Ocean-Going Ship Fleet through Approaches such as Cleaner Fuels, Incentives for Cleaner Ships, Smoke (Opacity) Limits
Reduce Emissions from Jet Aircraft through Approaches such as More Stringent Engine Standards, Retrofit Controls, Cleaner Fuel, and Applying Standards to Non-Tactical Military Aircraft
More Stringent Emission Standards for New and Remanufactured Locomotive Engines
Incentives to Accelerate Clean Up of Existing Diesel Engines

A short description of each concept is provided on the following pages. Many of these concepts are described in detail under the applicable source category in Section II.

**a. On-Board Diagnostics for New Trucks and Buses**

On-board diagnostic (OBD) systems ensure that the sophisticated emission control devices needed to meet emission standards are working. The OBD systems currently installed on heavy-duty diesel vehicles are designed primarily to detect gross failures. ARB staff is working closely with U.S. EPA on an OBD program for heavy-duty engines and vehicles. The comprehensive OBD system would alert the vehicle operator of the malfunction through a dashboard light. As with light-duty vehicles, an OBD system for heavy-duty vehicles would likely not require the addition of many new sensors or components. Instead, the OBD system would consist primarily of software in the existing on-board computer and will use many of the existing engine and emission control sensors.

**b. In-Use Testing for Existing Trucks and Buses**

This concept would require manufacturers of heavy-duty diesel engines to test a specific number of engines per engine family by procuring and testing in-use vehicles at various mileage intervals. This is similar to the in-use testing requirements already in place for light-duty vehicle manufacturers. The responsibility for procuring and testing the vehicles would rest with the engine manufacturers, not with the U.S. EPA. ARB is working closely with U.S. EPA to develop this measure.

**c. Lower Emission Standards for New Off-Road Diesel Engines**

Most diesel (compression-ignition) engines are currently regulated, but can meet more stringent emission standards with the incorporation of advanced technology into the engines. ARB is working closely with U.S. EPA to establish nationwide lower emission standards for off-road diesel engines. U.S. EPA's current proposal calls for tighter PM10 standards beginning in 2011 and tighter NOx standards beginning in 2012.

**d. Low-Sulfur Diesel Fuel for Off-Road Engines**

Although U.S. EPA has a rule requiring low-sulfur diesel fuel in on-road vehicles nationwide starting in 2006, it has not yet set low-sulfur diesel fuel requirements for off-road engines. U.S. EPA has proposed to require 15 ppm sulfur diesel fuel for land-based off-road engines nationally by 2010 and sought comment on extending the requirement to locomotives and marine vessels. Broad national standards for 15 ppm sulfur diesel fuel should apply to every type of off-road diesel engine by 2010 or earlier. This would cut emissions directly and enable advanced control technology on both new and existing diesel engines in all applications.

**e. Emission Standards for New Harbor Craft and Ocean-Going Ships**

The International Maritime Organization (IMO) and the U.S. EPA have adopted exhaust emission standards for new marine diesel engines. However, the current standards do not achieve the maximum possible emission reductions with available emission control technology. U.S. EPA could achieve additional emission reductions by 1) pursuing more stringent IMO standards for all commercial marine vessels over 130 kilowatt (kW), 2) adopting more stringent U.S. EPA standards for harbor craft over 37 kW and 3) adopting new U.S. EPA standards for U.S. and foreign-flagged ocean-going ships.

**f. Clean Up the Existing Ocean-Going Ship Fleet**

Because of the long-life of marine engines, reducing emissions from the in-use fleet can have significant emission benefits. U.S. EPA could reduce emissions from in-use marine vessels by implementing strategies such as operational controls, requiring



the use of cleaner fuels, implementing incentive programs to encourage cleaner vessels, setting opacity limits, and providing for the use of electrical power for hotelling.

**g. Lower Emission Standards for New and Remanufactured Locomotives**

Requiring even more stringent locomotive emission standards would encourage improvements in locomotive engine technology, further reducing emissions and health risks nationwide. In its proposal for tighter land-based off-road engine standards, U.S. EPA indicated that it is considering lower emission standards for new and remanufactured locomotive engines in the post-2010 timeframe.

**h. Reduce Emissions from Jet Aircraft**

The options for reducing emissions from jet aircraft include lower emission standards for aircraft engines, installing engine emission retrofit kits, reformulating jet fuel, and applying commercial aircraft engine standards to non-tactical military aircraft. Some of these approaches would require new technology and considerable investments in research and development funding by the National Aeronautics and Space Administration, airframe manufacturers and jet aircraft engine manufacturers.

**i. Incentives to Accelerate Clean Up of Existing Diesel Engines**

The federal government could provide economic incentives to accelerate clean up of diesel engines, especially those used in school buses and farm operations. This approach could reduce the risk from toxic diesel particulate emissions, as well as emissions that contribute to ozone formation.

## **CHAPTER C. STATE IMPLEMENTATION PLAN COMMITMENTS**

### **1. 2003 South Coast State Implementation Plan**

This chapter provides additional information about the proposed State long-term commitment for the South Coast (contained in Section I.D.1), including further discussion of ARB staff's approach and expectations for development of the long-term strategy.

The federal CAA recognizes that extreme ozone nonattainment areas, such as the South Coast, must rely on evolving technologies to meet attainment goals. Consistent with section 182(e)(5) of the Act, prior SIPs for South Coast have included a long-term commitment to achieve the last increment of emission reductions, with the remaining measures to be defined by 2007.

The approved 1999 South Coast SIP included commitments for long-term State and federal measures approved under section 182(e)(5). ARB adopted its defined long-term measures, including the Low Emission Vehicles II and Heavy-Duty Diesel Off-Road standards earlier than anticipated in the SIP. ARB has already satisfied its existing long-term commitment to reduce NOx, but not ROG.

The new SIP shows a need for much greater emission reductions than the 1999 SIP for two reasons: (1) improved mobile estimates raise the emissions starting point in the 1997 baseline and (2) the Plan uses a more severe modeling episode that lowers the ROG target by 100 tpd.

After accounting for the anticipated benefits of both adopted and new near-term defined State and local measures, the 2003 SIP demonstrates a need for another 265 tpd ROG reductions and 181 tpd NOx reductions from long-term measures. This represents 30 percent of the total reductions needed by 2010. We believe that this gap can be bridged through a cooperative effort by the local, State and federal agencies responsible for specific emission sources. This effort should focus on how to most effectively achieve the additional reductions, considering the availability and cost of potential controls. As the State agency charged with ensuring California's SIP compliance, ARB is ultimately responsible for ensuring the necessary measures are identified by 2007 and the emission reductions achieved by 2010.

We propose that ARB lead a multi-agency (State, federal, local) effort with the public to assess potential control concepts for every type of emission source and develop the full scope of strategies needed to achieve these reductions. In this report, we identify potential concepts to explore for the long-term measures. We have also received suggestions from others. In early 2004, ARB staff plans to initiate a public process to solicit further ideas for development of the long-term measures.

ARB staff will work in partnership with the South Coast Air Quality Management District (District), U.S. EPA, the Southern California Association of

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Governments (SCAG), and the public to assess potential emission reduction concepts to meet the long-term commitments via regulatory programs as well as innovative approaches such as incentives, voluntary programs, episodic controls, and other actions. Every type of emission source – mobile, stationary, and area – as well as new and existing -- will need to be evaluated to determine the remaining emissions in the attainment year, and the possibility for further emission reductions.

This effort will rely heavily on input and feedback from interested stakeholders. The public's participation will be important both in identifying potential emission reduction concepts and developing approaches to achieve those emission reductions in practice. The support of stakeholders in crafting ways to overcome implementation barriers and providing assistance to ultimately obtain the emission reductions will be a key component to meeting the long-term commitment.

Special attention will be given to achieving reductions from in-use on-road and off-road mobile sources because of the extended life of these sources. For airports, ports, and rail yards, the agencies will consider facility-based approaches to reduce overall emissions. For these types of sources, a comprehensive approach may be the most effective way to reduce emissions of ozone and fine particulate precursors, as well as address community health concerns.

We expect that U.S. EPA and other federal agencies will pursue new requirements for national and international sources, and complement them with financial incentives to speed turnover of the diesel fleet to cleaner engines. ARB also expects that the District will actively participate in the technical and regulatory processes to identify and adopt all feasible, cost-effective measures needed for attainment, including actions beyond the District's commitments for near-term and long-term measures. Finally, we expect that SCAG will work with ARB and the District to identify how transportation decisions can support further emission reductions through direct funding of cleaner engine projects or through programs to reduce the rate of growth in vehicle travel.

The District assigned responsibility for long-term emission reductions by agency. The District committed to 31 tpd ROG reductions from long-term measures and assigned the remaining 234 tons of ROG and all 181 tons of NO<sub>x</sub> reductions to be achieved by ARB and U.S. EPA. We view this as a placeholder between now and 2007, when the long-term measures must be defined. Until that process is complete, the relative long-term emission reduction split among agencies can't realistically be defined. Nonetheless, it's clear that ARB, U.S. EPA, the District and local government need to obtain additional reductions and we acknowledge ARB's responsibility to ensure that measures to achieve those reductions are ultimately identified and implemented.

We believe that all agencies must actively seek to identify additional cost-effective control strategies to achieve the maximum feasible reductions from all source categories. Part of this evaluation will include a discussion of which agency or agencies can most effectively obtain the emission reductions in practice. We expect that the

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appropriate agency will begin development as soon as practicable. Once all of the specific long-term measures are identified, the resulting reductions to be achieved by each agency may be different than envisioned by the District.

To reconcile the District's adopted strategy with ARB staff's recommendations, we propose that: (1) the Board approve the local air district commitment for 31 tpd ROG reductions and the targets for the federal government of 18 tpd ROG and 68 tpd NOx reductions, and (2) the State assume overall responsibility to assure that measures are identified by 2007 and implemented by 2010 to achieve the remaining 216 tpd ROG and 113 tpd NOx reductions needed for ozone attainment in the South Coast.

If U.S. EPA does not agree to carry out its legal responsibility for new emission reductions, the District adopted a backstop approach to relax the region's NOx control target by a corresponding 68 tpd. Because stringent NOx control is essential for addressing the health threat from fine particulate pollution, ARB staff is proposing that the Board allow the federal reductions of 18 tpd ROG and 68 tpd NOx to be added to the overall State long-term commitment if needed, with no modifications to the control target at this time. As part of the process of developing the long-term measures, we continue to use every possible means to press our federal counterparts to act where the State and local air agencies cannot. Table IV-3 shows the resulting range of reductions that would be addressed by the proposed State long-term strategy.

By 2007, the District and ARB will prepare a revision to the Ozone SIP that: (1) reflects any modifications to the 2010 emission reduction target based on updated science, and (2) identifies the additional strategies, including the implementing agencies, needed to achieve the necessary emissions reductions by 2010. If the specific measures developed to satisfy the long-term obligation affect on-road motor vehicle emissions, we will work with the District and SCAG to revise the transportation conformity budgets accordingly. This schedule would harmonize with the anticipated requirement to submit SIPs in 2007 to attain the federal eight-hour ozone standard and the fine particulate matter standards in the post-2010 timeframe.

**Table IV-3**  
**Proposed State Long-Term Strategy**  
**South Coast 2003 Ozone SIP**  
(tons per day)

Strategy (Agency)	Name	Final Action Date	Implementation Date	Expected Reductions (South Coast 2010)	
				ROG	NOx
LONG- TERM (ARB)	<b>Lead Multi-Agency Effort (State, federal, and local) and Public Process Beginning in 2004 to Identify and Adopt Long-Term Measures</b>	2007- 2009	2010	216-234	113-181

**2. Future State Implementation Plans**

If other regions of California are reclassified to extreme and develop attainment SIPs that require long-term strategies, ARB will work with each region to identify any additional measures that are needed based on the nature of the problems in a particular region.